

In the Claims

Please replace claims 1, 7, 12, 14, 15 and 18 with the following claims:

b1 1 A method for implementing bump mapping, comprising:
generating a table of color values referenced by orientation-dependent color variables;
determining first and second vertex angle coordinates for a vertex vector;
interpolating the first and second vertex angle coordinates to provide first and second angle coordinates for each pixel in a polygon, the first and second angle coordinates representing a direction of the vertex vector at the pixel;
modifying the estimated angle coordinates, using a perturbation source;
converting the modified angle coordinates to one or more color variables; and
assigning the pixel a color value according to the one or more color variables.

b2 7 A graphics system comprising:
a geometry engine to associate vector orientation data with vertices of one or more polygons representing an object in an image;
a color map including color values for a sample of vector orientations, each color value being referenced by one or more orientation dependent color variables;
a perturbation source to provide orientation perturbations; and
a rendering engine to convert a vertex vector and a vertex perturbation to a pair of vertex angles and a pair of vertex perturbation values, respectively, estimate pairs of

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color

angle coordinates and perturbation coordinates for each pixel in the polygon from the pairs of vertex angles and perturbation values, respectively, generate one or more perturbed color variables using the angle and perturbation coordinates, and assign a color value to each pixel according to its one or more color variables.

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12. A machine readable medium on which are stored instructions that are executable by a system to implement a method for assigning a color value to an image pixel, the method comprising:

generating color values for a sample of normal vector orientations, each color value being associated with one or more scaled angle coordinates representing a corresponding normal vector orientation;

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estimating first and second angle coordinates for the pixel from angle coordinates associated with a vertex vector;

perturbing the first and second angle coordinates to provide modified first and second angle coordinates; and

retrieving a color value for the pixel according to the perturbed first and second angle coordinates.

14. The machine readable storage medium of claim 12, wherein estimating comprises:

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interpolating the first and second angle coordinates for the pixel from the angle coordinates associated with the vertex vector; and

converting the interpolated first and second angle coordinates to scaled angle coordinates.

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A graphics system comprising:

means for associating [vector orientation data] a plurality of vertex angles with each vertex of one or more polygons representing an object in an image;

means for indicating color values for a sample of vector orientations, each color value being referenced by one or more orientation dependent color variables;

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color

means for providing orientation perturbations; and

means for converting the plurality of vertex angles for each polygon to a plurality of angle coordinates and perturbation coordinates for each pixel in the polygon; and

means for combining the angle and perturbation coordinates to provide a color value for each pixel through perturbed color variable.

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18. A system comprising:

a graphics pipeline; and

a memory, in which are stored instructions that are executable by the graphics pipeline to implement a method for assigning a color value to a pixel, the method comprising:

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generating color values for a sample of vector orientations, each color value being associated with first and second angle coordinates representing a corresponding vector orientation;

determining a pair of vertex angle coordinates for each vertex vector of a polygon that includes the pixel;

interpolating the pairs of vertex angle coordinates to provide first and second angle coordinates for the pixel;

perturbing the first and second angle coordinates to provide modified first and second angle coordinates; and

retrieving a color value for the pixel according to the perturbed first and second angle coordinates.